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Running Head: RISK TAKERS' PERSONALITY

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Who takes risks in high-risk sports? A typological personality approach

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Running Head: RISK TAKERS' PERSONALITY

Who takes risks in high-risk sports? A typological personality approach

Abstract

We investigated the risk-taking behaviors of 302 men involved in high-risk sports (downhill skiing, mountaineering, rock climbing, paragliding or skydiving). The sportsmen were classified using a typological approach to personality based on eight personality types, which were constructed from combinations of neuroticism, extraversion and conscientiousness. Results showed that personality types with a configuration of low conscientiousness combined with high extraversion and/or high neuroticism (Impulsive, Hedonist, Insecure) were greater risk-takers. Conversely, personality types with a configuration of high conscientiousness combined with low extraversion and/or high extraversion (Skeptic, Brooder, Entrepreneur) were lower risk-takers. Results are discussed in the context of typology and other approaches to understanding who takes risks in high-risk domains.

Key words: personality, typology, risk-taking behaviors, high-risk sports

Who takes risks in high-risk sports? A typological personality approach

Risk-taking research has largely focused on disinhibition behaviors, which are perceived as socially unacceptable volitional behaviors (e.g., dangerous driving, drug taking, gambling, promiscuous sex) in which insufficient precaution is taken and from which the outcomes are potentially very negative (e.g., serious injury or death of the self or others; Turner, McClure, & Pirozzo, 2004). Conversely, few studies have a dedicated focus on high-risk sports, in which the danger is recognized and socially accepted (Turner et al., 2004), although the potential consequences are equally serious.

High-risk sports, usually defined as sports where one has to accept the possibility of severe injury or death as an inherent part of the activity (Breivik, 1995), are demanding activities that require specialized equipment and training to manage the risks involved (cf. Fyffe & Peter, 1997). Nonetheless, although many high-risk sportspeople minimize the associated risks as much as possible, others seem to engage deliberately in risk-taking behaviors within the high-risk sport (e.g., Llewellyn & Sanchez, 2008; Slanger & Rudestam, 1997). Given the potentially life-threatening consequences of risk-taking enacted in high-risk sport (Bonnet, Pardinielli, Romain, & Rouan, 2003), it is important to understand which individual differences may lead some people to adopt them.

Personality seems to be one of the most important predictors of various risk-taking behaviors (Selosse, 1998; Vollrath, Knoch, & Cassano, 1999) and neuroticism, extraversion, and conscientiousness are the most studied personality factors in the high-risk health behaviors area (e.g., Bermúdez, 1999; Clarke & Robertson, 2005; Vollrath & Torgersen, 2002). However, of these three personality traits, neuroticism and extraversion yield equivocal findings. For example, although a number of researchers have reported a positive relationship between extraversion and high-risk health behaviors (Vollrath et al., 1999) or traffic and job accident involvement (e.g., Arthur & Graziano, 1996; Clarke & Robertson,

2005), other researchers have reported the opposite relationship in the same domains (e.g., Iverson & Erwin, 1997; Judge, 1993). Similar inconsistencies surround neuroticism findings: Many studies have demonstrated that individuals high in neuroticism are more prone to taking high-risk health behaviors (Vollrath et al., 1999) and are more accident-involved (e.g., Clarke & Robertson, 2005; Sutherland & Cooper, 1991); other studies have revealed that specific facets of neuroticism (e.g., depression) are negatively related to risk-taking behaviors (Robinson, 1985; Sleasman, 2004).

These equivocal findings are likely linked to the complexity of personality, notably the multi-faceted nature of some personality factors, particularly as they pertain to risk-taking. For example, although the positive affectivity of extraverts may reduce the likelihood of their risk-taking (Iverson & Erwin, 1997), they may also use risk-taking behaviors to achieve their desired level of arousal (Eysenck & Eysenck, 1985; Zuckerman, 1990). Indeed, according to Zuckerman (1990) sensation seeking appears to be a motivation for involvement in risk-taking behaviors inasmuch as these are an obvious way to experience sensations that increase the physiological arousal fulfilling the need for stimulation (see also Arnett, 1996). Thus, extraversion can be conceptualized as being associated with both an increase and a decrease in the tendency to approach risk. Similar complexities surround the relationship between neuroticism and risk. For example, some personality facets of neuroticism (e.g., anxiety, depression) might incite individuals to avoid risk-associated behaviors, as these will likely be perceived as complex and stressful events that the neurotic will feel unable to cope with (Robinson, 1985; Sleasman, 2004). Conversely, neurotic individuals might take risks with the aim of regulating feelings of distress and tension (Eysenck, 1990; Michel, Carton, & Jouvent, 1997). In fact, the immediate risk-associated sensations that are experienced might be a way of keeping negative affect at a distance, at least temporarily (Michel et al., 1997; Woodman, Cazenave, & Le Scanff, 2008; Woodman, Huggins, Le Scanff, & Cazenave, in press).

1 In contrast to extraversion and neuroticism, conscientiousness consistently predicts the
2 inclination to refrain from risk-taking behaviors (Vollrath et al., 1999). The definition of
3 conscientiousness includes a number of different aspects: competence, order, dutifulness,
4 achievement striving, self-discipline and deliberation. There is evidence that these personality
5 traits are consistent with the development of healthy behaviors and the achievement of higher
6 levels of psychic and physical well-being (McCrae & Costa, 1999). Conversely, a lack of
7 conscientiousness is linked to a high level of risk taking (Clarke & Robertson, 2005; Vollrath
8 & Torgersen, 2002). Indeed, research has shown that individuals low in conscientiousness are
9 more prone to reckless driving, substance abuse, and high-risk sexual behaviors (Bermúdez,
10 1999; Vollrath et al., 1999). The negative relationship between conscientiousness and risk-
11 taking behaviors could be explained by several relevant features of low conscientious people
12 such as carelessness, lack of self-control, impulsivity and a lack of respect for authority and
13 social order (Clarke & Robertson, 2005).

14 Although it is reasonably established that conscientiousness is negatively related to
15 risk-taking (Clarke & Robertson, 2005; Vollrath & Torgersen, 2002) little is known about
16 how the personality factors of extraversion and neuroticism might moderate this association
17 (Røvik et al., 2007). The examination of such interactions is at the heart of the typological
18 approach, which Vollrath and Torgersen (2002) used to examine personality differences in
19 relation to high-risk health behaviors (tobacco, alcohol, drug consumption; high-risk sexual
20 behaviors). Vollrath and Torgersen's typologies were built on combinations of high and low
21 scores on the three basic personality factors of neuroticism, extraversion, and
22 conscientiousness, which results in eight personality types (see Table 1). Vollrath and
23 Torgersen (2002) found that personality types that combine low conscientiousness with high
24 extraversion and/or high neuroticism (i.e., Impulsive, Insecure, Hedonist) increased the
25 susceptibility to high-risk health behaviors, probably due to their low self-control (West,

Elander, & French, 1993), and their need for stimulation and/or emotional regulation (Cooper, Agocha, & Sheldon, 2000; Taylor & Hamilton, 1997). Conversely, they found that high conscientiousness protected against the high-risk health behaviors associated with extraversion and/or neuroticism. Of these high conscientiousness types (Brooder, Entrepreneur, Skeptic) the combination of high conscientiousness with low extraversion and low neuroticism (Skeptic) was the most careful personality type.

Although Vollrath and Torgersen (2002) have provided evidence for the validity of the typological model of personality on disinhibited behaviors (e.g., high-risk health and sexual behaviors), no research attention has been paid to risk-taking in more socially accepted forms of risky activity, such as high-risk sports (Turner et al., 2004). The application of the typological approach may help us to better understand the individual differences that lead people to take risk within the high-risk sport domain. Consequently, the purpose of the present study was to investigate the relationships between personality factors and risk-taking in high-risk sports using this typological approach. We hypothesized that combinations of neuroticism, extraversion, and conscientiousness would predict the magnitude of risk-taking. Specifically, we hypothesized that low conscientious people with high neuroticism and/or high extraversion (i.e., Impulsive, Hedonist, and Insecure) would take the most risks in this high-risk domain. In contrast, high conscientious people with low neuroticism and/or low extraversion (Skeptic, Brooder and Entrepreneur) should take fewer risks.

Method

Participants and procedure

Of the 351 people originally contacted via internet forums of high-risk sports (national forums of high-risk sports in general and of specific high-risk sports), 315 (89.7%) agreed to participate in the study, completed a written informed consent form, and provided complete data. As previous research has shown sex differences in risk-taking (e.g., Kontos, 2004;

Morrongiello & Rennie, 1998) the few women participants ($N = 13$) were excluded from the study. The final sample comprised 302 French men who declared that they were currently practicing one of the five following high-risk sports as their main sport activity: downhill skiing ($n = 39$), mountaineering ($n = 152$), rock climbing ($n = 31$), paragliding ($n = 29$), or skydiving ($n = 51$). The t tests revealed that these high-risk sport groups did not differ significantly in age ($M = 31.6$ years; $SD = 9.7$), experience ($M = 10.6$ years; $SD = 7.7$), or ability level (self-assessment rated on a five-point Likert scale from 1 “*novice*” to 5 “*expert*”, $M = 4.2$; $SD = 1.5$), all $ps > .05$. The initial contact included a presentation of the study purpose and an assurance of confidentiality. Next, each participant was mailed a 10-page questionnaire. Participants' answers including the written informed consent were returned by post or electronic mail.

Measures

Personality. The personality dimensions of the Five-Factor Model (i.e., neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness) were assessed using the French version of the NEO Personality Inventory Revised (NEO PI-R; Costa & McCrae, 1992; Rolland, Parker, & Stumpf, 1998). This inventory comprises 240 items rated on a five-point Likert scale from 0 (*strongly disagree*) to 4 (*strongly agree*). Each of the five NEO PI-R scales contains 48 items and yields a score between 0 and 192. The internal reliability coefficients of the present sample range from .86 to .88. In accordance with Torgersen's model (Torgersen, 1995; Vollrath & Torgersen, 2002), typologies were constructed from three scales of the NEO PI-R: neuroticism, extraversion, and conscientiousness. Factor scores were split at the median, and participants were assigned to one of the eight personality types by combining high and low scores on each dimension (see Table 1): Impulsive ($n = 32$), Hedonist ($n = 26$), Insecure ($n = 55$), Spectator ($n = 31$), Complicated ($n = 31$), Entrepreneur ($n = 56$), Brooder ($n = 31$), and Skeptic ($n = 40$).

1 *Risk-taking.* Whereas risk-taking is readily observed and assessed in domains such as
2 road traffic (e.g., speeding, drink driving, not using a safety belt, traffic law violations), the
3 specificity of the high-risk sports environment makes the identification and objective
4 measurement of risk-taking rather more complex. Moreover, as the objective surveillance of
5 the large cohort of participants over time was logistically untenable (cf., Frone, 1998;
6 Westaby & Lowe, 2005), two self-report methods were used in this study to assess risk-
7 taking:

8 *Accidents.* The number of previous accidents is an objective measurement that has
9 been widely used in previous research (e.g., Bonnet et al., 2003; Cherpitel, Meyers, &
10 Perrine, 1998; Cogan & Brown, 1999; Rossi & Cereatti, 1993). Participants were
11 asked to report the number of accidents that they had experienced since the beginning
12 of their practicing the activity. They were asked to report only those accidents that had
13 resulted in severe injury involving withdrawal from participation for one day or more
14 and requiring medical attention. In order to control for number of years' exposure to
15 the high-risk sport, we also asked participants to provide the number of years they had
16 been practicing their sport. The ratio of accidents / years' practice was used as a
17 measure of accidents.

18 *Risk-taking behaviors.* Participants were asked to complete the three-item risk-taking
19 behavior scale (Lafollie & Le Scanff, 2007; see also Westaby & Lee, 2003). The items
20 of this scale are: "When practicing my high-risk sport I have sometimes been involved
21 in accidents (during last two years) that are caused by my somewhat irresponsible
22 attitude"; "I think I am very careful and far-sighted when I practice my high-risk
23 sport" (reverse scored); "My friends or colleagues who are experts in the activity think
24 that I take too many risks when I practice my high-risk sport". Each item was scored

on a five-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). This instrument showed acceptable internal reliability with Cronbach's alpha of .70.

Results

Preliminary analyses

The assumptions of parametric and multivariate analysis (cf. Tabachnick & Fidell, 2001) were satisfied for the present data set. In order to verify that no specific sport group was more prone to risk-taking than any other, we ran one-way randomized ANOVAs, which revealed no significant differences in accidents, $F(4, 297) = 0.85, p = .49, \eta^2 = .01$, or risk-taking behaviors, $F(4, 297) = 0.53, p = .71, \eta^2 < .01$. Moreover, a chi-square test showed no difference in the dispersion of sport groups between personality types, $\chi^2(28, N = 302) = 14.72, p = .98$. In other words, each personality group had an equal number of sports represented within it in relation to the total sample (downhill skiing, 12.91%; mountaineering, 50.33%; rock climbing, 10.27%; paragliding, 9.60%; and skydiving, 16.89%). Finally, there was no significant difference between personality types for experience, $F(7, 294) = 1.68, p = .11, \eta^2 = .04$. However, there was a significant age difference between personality types, $F(7, 294) = 3.07, p < .01, \eta^2 = .07$. Consequently, we included age as a covariate in subsequent analyses.

Risk-taking differences between personality types

In order to investigate differences between the eight personality types on risk-taking, we ran a one-way randomized MANCOVA, with personality types as the independent variable, number of accidents and risk-taking behaviors as dependent variables, and age as covariate. Single-factor ANCOVAs and Tukey's post-hoc tests were used to observe specific differences between the personality types for each dependent variable. In line with Vollrath and Torgersen (2002), differences were also examined by comparing each typology to the average of the other seven types pooled with simple *a priori* contrasts.

The MANCOVA revealed a significant personality type difference on risk-taking, Wilks' Lambda $F(14, 584) = 3.55, p < .001, \eta^2 = .08$. ANCOVAs showed significant personality type differences for accidents, $F(7, 293) = 2.70, p < .01, \eta^2 = .06$, and for risk-taking behaviors, $F(7, 293) = 5.10, p < .001, \eta^2 = .11$. Tukey's post-hoc tests and *a priori* contrast tests are reported next for accidents and risk-taking behaviors, respectively.

Accidents. Tukey's post-hoc tests revealed a significant difference between the Impulsive and Skeptic personality types, with Impulsive persons reporting more accidents than Skeptic persons (see Table 2). The *a priori* contrasts advocated by Vollrath and Torgersen (2002) revealed that the Impulsive personality type reported more accidents than the seven other types pooled, $t(300) = 3.46, p < .001$; the Skeptic personality type reported fewer accidents than the seven other types pooled, $t(300) = 2.87, p < .01$.

Risk-taking behaviors. Tukey's post-hoc tests revealed significant differences between each of the three hypothesized high-risk personality types (Impulsive, Hedonist, and Insecure) and each of the three hypothesized low-risk personality types (Skeptics, Brooders, and Entrepreneurs), with the so-called high-risk personality types reporting a higher degree of risk-taking behaviors than low-risk personality types (see Table 2). The *a priori* contrasts also revealed that each of the three hypothesized high-risk personality types reported a higher degree of risk-taking behaviors than the seven other types pooled: Impulsive, $t(300) = 3.54, p < .001$; Hedonist, $t(300) = 2.02, p < .05$; and Insecure, $t(300) = 1.97, p < .05$; each of the three hypothesized low-risk personality types reported a lower degree of risk-taking behaviors than the seven other types pooled: Skeptic, $t(300) = 2.44, p < .05$; Brooder, $t(300) = 3.03, p < .01$; Entrepreneur, $t(300) = 2.51, p < .05$.

No significant differences for the number of accidents or the risk-taking behaviors emerged for the Complicated type and the Spectator type. Thus, in agreement with Vollrath

and Torgersen (2002), these personality profiles are neither particularly low nor particularly high risk takers.

Discussion

In order to better understand the personality differences that lead some people to take risks in high-risk sport, the present study examined the interactive relationships between three personality factors on risk-taking behaviors. The results revealed that the typological combinations of neuroticism, extraversion, and conscientiousness were largely successful in discriminating between self-reported low-risk takers and high-risk takers. Specifically, Skeptic, Brooder, and Entrepreneur persons reported lower risk-taking behaviors with Skeptics also reporting significantly fewer accidents. Conversely, Impulsive, Hedonist, and Insecure persons reported greater risk-taking behaviors with Impulsives also reporting significantly more accidents.

The risk-taking of Impulsive persons could be explained by their desire to enhance bodily sensation experiences (Cooper et al., 2000) and their tendency to focus on satisfying immediate needs for stimulation, regardless of future consequences for themselves or for others (West et al., 1993; Zuckerman, 1990). Focusing on bodily sensations may also serve to divert Impulsives' attention from their ill-being and problems (Cooper et al., 2000; Taylor & Hamilton, 1997). If the impulsive person relies on the mastery of danger to experience relief and well-being, he/she is more likely to come to depend on risk-taking as a means of emotion regulation (Pardinielli, Rouan, Gimenez, & Bertagne, 2005; Woodman et al., 2008; Woodman et al., in press). It seems likely that ever-increasing levels of risk and the associated risk of accidents will be necessary to satisfy such people despite their knowledge of the potential negative outcomes (Assailly, 2007). While Impulsives might use risk-taking behaviors as a means of regulating their negative affect (Cooper et al., 2000; Taylor & Hamilton, 1997), Hedonists do not appear to have such emotional difficulty and are likely oriented by the

positive affect and pleasure associated with the risk behavior (Zuckerman, 1990). Less aware of their own limits, Hedonists may take risks simply to satisfy sensation seeking needs, regardless of the risk to themselves and to others (West et al., 1993). The propensity for Insecure individuals to take risks is less clear. In fact, introverted and neurotic persons are very concerned about their current and future health risks (Vollrath et al., 1999; Watson & Pennebaker, 1989). Thus, one might expect such individuals to tend toward avoiding risky situations (Deroche, Stephan, Brewer, & Le Scanff, 2007). However, the negative affectivity of Insecure individuals in conjunction with their low self-control could lead them to engage in risk behaviors as a means of coping with aversive mood states and ill-being (Cooper et al., 2000).

In line with the equivocal findings from previous research the present study highlights that the relationship between extraversion and risk-taking should not be conceptualized in isolation from other dimensions of personality. Indeed, extraversion may be positively related to risk-associated behavior for some people (Impulsives and Hedonists) and negatively related for others (Insecures). In the same way, neuroticism may be linked positively (Impulsives and Insecures) or negatively (Hedonists) with risk-taking behaviors. Thus, it is only the combination of the personality factors of neuroticism, extraversion and conscientiousness that allows us to identify low and high-risk takers within high-risk sport. Moreover, although low conscientiousness is not always linked to risk-taking (e.g., when it associated with low extraversion and low neuroticism; Spectators), this trait appears as the most consistent personality predictor of risk-taking in high-risk sport. The negative relationship between conscientiousness and risk-taking behaviors could be explained by several characteristics of low conscientiousness individuals (Clarke & Robertson, 2005). For example, individuals who are low in conscientiousness exhibit behaviors that are characterized by a focus on satisfying immediate needs, regardless of future consequences for oneself or for others (West et al.,

1993). They also set fewer goals, do not follow rules (Arthur & Doverspike, 2001), and do not have a logical or systematic approach to decision making or cost–benefit analysis (Wallace & Vodanovich, 2003). Conversely, the health protective effect of conscientiousness could be explained by its characteristic ingredients of tenacity, persistence, and effort that favor social success and improve quality of life, as well as being essential factors for maintaining goal-directed behavior (Bermúdez, 1999).

Although the results from the present study are promising, several limitations should be considered. First, the use of personality typology has been criticized by some authors (e.g., Grant & Langan-Fox, 2006; Røvik et al., 2007). For example, Pittenger (2004) argued that the typological categorization comes at a cost, and recommended the use of more traditional multiple regression analyses to study the multidimensional, potentially interactive, effects of personality on risk-taking (cf. Korotkov & Hannah, 2004). In contrast, Vollrath and Torgersen (2002) advocated the use of typology insofar as this method allows one to avoid the potential problem of non-linearity associated with the three-way interactive effect of personality traits on individuals' behaviors (see also Grant & Langan-Fox, 2006). Another advantage of the typological approach is its ability to provide a reasonably simplified view of a complex process (i.e., three-way interactions between personality traits) and thus allows one more easily to classify individuals (Pittenger, 2004). Of course, if one accepts the aforementioned criticisms that can be leveled at the typological approach, the present results emerge as hypothesized despite such limitations rather than because of them. As such, the results are all the more robust and provide strong support for the notion that one can discriminate between different degrees of risk-taking on the basis of personality typology. At the very least, the typological approach seems worthy of future investigation in the high-risk domain.

A second potential limitation of the present typological approach is that it uses only three factors of personality. That is, Torgersen's typology ignores the potential variance

1 accounted for by openness to experience and agreeableness (Pittenger, 2004). This is
2 potentially important given that previous research has revealed a positive relationship
3 between openness to experience and risk-taking (Clarke & Robertson, 2005) and a negative
4 relationship between agreeableness and risk-taking (Mesken, Lajunen, & Summala, 2002).
5 Thus, discarding these personality factors might reduce the possibility of developing a robust
6 model that predicts individual differences in risk-taking. We believe that future research
7 would do well to consider how the typological model might be extended to incorporate all
8 five personality factors in this risk-taking context.

9 Third, some methodological limitations should also be borne in mind when assessing
10 these findings. Whereas risk-taking behaviors are readily observed and assessed in some
11 domains such as road traffic (e.g., speeding, drink driving), the specificity of the high-risk
12 sports environment makes the identification and measurement of risk-taking more complex.
13 In the current study we used two indices of risk-taking: the relative number of accidents
14 experienced within the activity; and the level of declared risk-taking behaviors. Clearly, each
15 has its limitations. As accidents are the most extreme outcome of a risky situation and can be
16 strongly linked with environmental factors (e.g., difficult weather), they are likely a rather
17 crude measure of risk-taking. Moreover, participants in the present study were asked to report
18 the number of accidents that they had experienced since the beginning of their involvement in
19 the activity. Although we used the ratio of accidents / years' practice as an adjusted measure
20 of accidents, the lack of a specific time-frame used when assessing accident and injury recall
21 may have been a limitation. Specifically, more recent accidents may have taken recall
22 prevalence over more temporally distal accidents and this difference may have been greater
23 for those who had been involved in their sport for many years. Further, although the risk-
24 taking behaviors inventory that we used was a rather more refined measure of risk-taking, it
25 nevertheless has the inconvenience of being reliant on self-report. It is, however, worth noting

1 that the results emerged as hypothesized despite these limitations. Nonetheless, future
2 research should certainly consider measurements other than self-report (e.g., peer
3 assessments, objective observation criteria).

4 In summary, the findings of the current study contribute to an in-depth understanding
5 of individual differences involved in risk-taking behaviors adopted in a socially accepted
6 high-risk domain. The personality typology approach provided a sound framework for this
7 investigation and should prove useful in developing individually tailored prevention strategies
8 with a particular focus on the potential buffering role of conscientiousness.

9

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